

Remarks

Applicants respectfully request reconsideration of the rejection of the claims in view of the above amendments and the remarks set forth below. Claims 1-20 remain in the application. Claims 1, 11 and 15 are amended. Claims 2-10, 12-14 and 16-20 were previously presented.

35 U.S.C. §103

Claims 1-20 stand rejected under 35 U.S.C. 103 (a) as being unpatentable over Griffiths (US 6,262,776 B1). Under U.S.C. § 103, the prior art reference (or references when combined) must teach or suggest all of the claim limitations (MPEP § 706.02(j)). Claim 1 is amended to recite a “system that maintains synchronization between a video signal and an audio signal that are processed using audio and video clocks that are locked, the system comprising...a component that determines an initial audio input buffer level...a component that determines an amount of drift in the initial audio input buffer level and adjusts the locked audio and video clocks to maintain the initial audio input buffer level if the amount of drift reaches a first predetermined threshold...and a component that measures a displacement of a video signal associated with the audio signal in response to the adjusting of the locked audio and video clocks and operates to negate the measured displacement of the video signal if the measured displacement reaches a second predetermined threshold.” Support for the amendment is found in the preamble of claim 1, figure 1, and page 9, lines 4-8. The claimed “locked audio and video clocks” elements of amended claim 1 are an important aspect of Applicants’ invention. As discussed in the BACKGROUND OF THE INVENTION (page 1, ln. 20 – Page 2, ln. 2):

Some audio/video receiver modules, which may be incorporated into display devices such as televisions, have been designed with an audio output digital to analog (D/A) clock that is locked to a video output D/A clock. This means that the audio clock and video clock cannot be controlled separately. A single control system may variably change the rate of both clocks by an equal percentage. In some of these systems, a clock recovery system may match the video (D/A) clock to the video source analog to digital (A/D) clock. The audio output D/A clock may then be assumed to match to the audio source A/D clock. This assumption is based upon the fact that broadcasters are supposed to similarly lock their audio and video clocks when the source audio and video is generated.

Although the Advanced Television Systems Committee (ATSC) specification requires broadcasters to lock their video source A/D clock to their audio source A/D

clock, there have been instances where these clocks were not locked. Failure of broadcasters to lock the clock of transmitted audio source material with the clock of transmitted video source material may result in a time delay between when the audio presentation should be occurring and when the audio is actually presented. This error, which may be referred to as lip synchronization or lip sync error, may cause the sound presented by the audio/video display device to not match the picture as it is displayed. This effect is annoying to many viewers.

Furthermore, as discussed in DETAILED DESCRIPTION (page 8, lns. 25-35):

At block 204, the initial audio input buffer level is determined. Over time, the amount of drift of the initial audio input buffer level is determined, as shown at block 206. If the drift exceeds a first predetermined threshold (208), then the locked clocks of the video D/A converter 32 (FIG. 1) and the audio D/A converter 34 are adjusted in the direction that maintains the initial audio input buffer level.

In response to the adjustment of the clocks, the displacement of the video signal is measured, as shown at block 212. If the displacement of the video signal exceeds a second predetermined threshold (214), then the measured displacement of the video signal is negated (block 216) by, for example, restarting the process or dropping a video frame to improve synchronization. At block 218, the process ends.

In other words, the claimed invention, as set forth in amended claim 1, is directed towards a system that maintains synchronization between a video signal and an audio signal that are processed using locked audio and video clocks. If a predetermined amount of drift between audio and video is detected (by observing a change in the initial audio input buffer level), the locked audio and video clocks are adjusted to maintain the initial audio input buffer level. If the video signal is displaced too much (i.e., exceeds a second predetermined threshold) due to the adjustment of the locked audio and video clocks, the displacement of the video signal is negated by, for example, restarting the synchronization process or dropping a video frame from the video signal.

Griffits appears to disclose a system and method for maintaining synchronization between audio and video by playing video frames early, dropping video frames or delaying the playing of video frames. (See, e.g., col. 12, lns. 28-40 and 56-64; col. 15, lns 39-42; col. 16, lns. 38-45) In other words, Griffits appears to only disclose adjusting the display of video data and not adjusting the processing of audio data in order to maintain synchronization between

audio and video data. Indeed, as acknowledged in the Office Action Griffiths does not disclose use of audio or video clocks. Official notice of write and read clocks used for buffering audio buffers and video buffers is then taken. Applicants are unsure what the combination of Griffiths and write and read clocks would result in, however, Applicants' respectfully propose that such a combination would fail to teach or suggest the "system that maintains synchronization between a video signal and an audio signal that are processed using audio and video clocks that are locked, the system comprising...a component that determines an initial audio input buffer level...a component that determines an amount of drift in the initial audio input buffer level and adjusts the locked audio and video clocks to maintain the initial audio input buffer level if the amount of drift reaches a first predetermined threshold...and a component that measures a displacement of a video signal associated with the audio signal in response to the adjusting of the locked audio and video clocks and operates to negate the measured displacement of the video signal if the measured displacement reaches a second predetermined threshold" limitations of amended claim 1. Therefore, it is respectfully proposed that the rejection of amended claim 1 under 35 U.S.C. § 103(a) is overcome in accordance with the above amendment and remarks and notice to that effect is earnestly solicited.

Dependent claims 2-6 being dependent on and further limiting amended independent claim 1, should be allowable for that reason, as well as for the additional recitations that they contain. Applicants respectfully requests reconsideration of the rejection of the claims in view of the above remarks.

Amended independent claim 11 contains elements similar to amended independent claim 1 and should be allowable for the reasons discussed above. Therefore, it is respectfully proposed that the rejection for obviousness is overcome.

Dependent claims 12-14 being dependent on and further limiting amended independent claim 11, should be allowable for that reason, as well as for the additional recitations that they

contain. Applicants respectfully requests reconsideration of the rejection of the claims in view of the above remarks.

Amended independent claim 15 contains elements similar to amended independent claim 1 and should be allowable for the reasons discussed above. Therefore, it is respectfully proposed that the rejection for obviousness is overcome.

Dependent claims 16-20 being dependent on and further limiting amended independent claim 15, should be allowable for that reason, as well as for the additional recitations that they contain. Applicants respectfully requests reconsideration of the rejection of the claims in view of the above remarks.

Having fully addressed the Examiner's rejections it is believed that, in view of the preceding remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the Applicants' attorney at (818) 260-3727, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fees, other than those discussed above, are believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,



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Patent Operations

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I hereby certify that this amendment is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on:

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Vincent E. Duffy

Report to Data Base
 Docket No. **P0020444** Serial No. **10/531,695** Filed: **4/18/05**
 Inventor(s): **Phillip Aaron Tucker/Feld et al.**
 Title: **A Method and System For Maintaining Lip Synchronization**
 Patent No. _____
 Atty: **Vincent E. Duffy**

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APPLICATION AS FILED

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